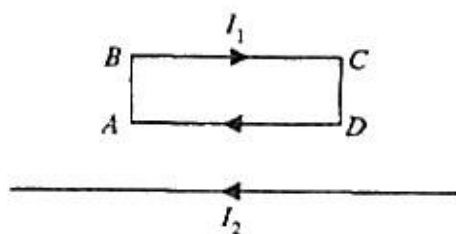


47. The graph above shows the electric potential V in a region of space as a function of position along the x -axis. At which point would a charged particle experience the force of greatest magnitude?

(A) A
 (B) B
 (C) C
 (D) D
 (E) E

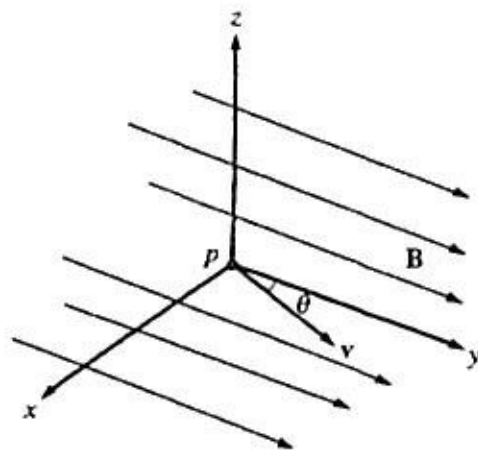
48. The work that must be done by an external agent to move a point charge of 2 mC from the origin to a point 3 m away is 5 J . What is the potential difference between the two points?

(A) $4 \times 10^{-4} \text{ V}$
 (B) 10^{-2} V
 (C) $2.5 \times 10^3 \text{ V}$
 (D) $2 \times 10^6 \text{ V}$
 (E) $6 \times 10^6 \text{ V}$



49. A rigid, rectangular wire loop $ABCD$ carrying current I_1 lies in the plane of the page above a very long wire carrying current I_2 , as shown above. The net force on the loop is

(A) toward the wire
 (B) away from the wire
 (C) toward the left
 (D) toward the right
 (E) zero



50. A uniform magnetic field \mathbf{B} is parallel to the xy -plane and in the $+y$ -direction, as shown above. A proton p initially moves with velocity \mathbf{v} in the xy -plane at an angle θ to the magnetic field and the y -axis. The proton will subsequently follow what kind of path?

(A) A straight-line path in the direction of \mathbf{v}
 (B) A circular path in the xy -plane
 (C) A circular path in the yz -plane
 (D) A helical path with its axis parallel to the y -axis
 (E) A helical path with its axis parallel to the z -axis